



WATER RESOURCES RESEARCH GRANT PROPOSAL

Title: A Molecular, Community-Based Approach for Tracking Pathogenic Bacteria Through Coastal Watersheds

Focus Categories: NPP, WQL, ECL

Keywords: bacteria, beaches, biotechnology, coastal zone, pathogens, land use, land-water interactions, runoff, soil microbiology, storm water management, streams, watershed management.

Duration: 7/1/99 - 6/30/00

Federal Funds Request: \$24,997

Non-Federal Matching Funds Pledged: \$24,997

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Abstract

Contamination of coastal waters occurs in human-developed watersheds. In this work, we address the issue of coastal watershed contamination where the contaminants are non-indigenous pathogenic microbes (NIPMs). This work specifically responds to the need for more accurate and comprehensive approaches to detect and quantify NIPMs in a wide range of watershed compartments so that the origins of NIPMs can be determined and their sources controlled. In this research, we are using denaturing gradient gel electrophoresis (DGGE) to examine the composition of bacterial assemblages in aquatic samples throughout two coastal watersheds (urban and rural). We will analyze DGGE band patterns to describe bacterial assemblages within and across watersheds, and during both wet and dry weather conditions. We will excise significant bands from DGGE gels and sequence the bands to determine the relatedness of organisms represented by bands to currently catalogued and known strains. We will further test the validity of using DGGE in this way through the use of laboratory microcosms. We will analyze DGGE gels and sequence bands arising from watershed samples and from laboratory microcosms. We recognize the need for rapid and accurate measures to indicate the presence of pathogens in environmental samples and expect to offer alternative and, as compared to conventional indicator tests, more comprehensive methodologies as a result of this research.